



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy



Clean Energy Manufacturing Innovation Institutes

**Presented to the
Biomass Research and Development
Technical Advisory Committee**

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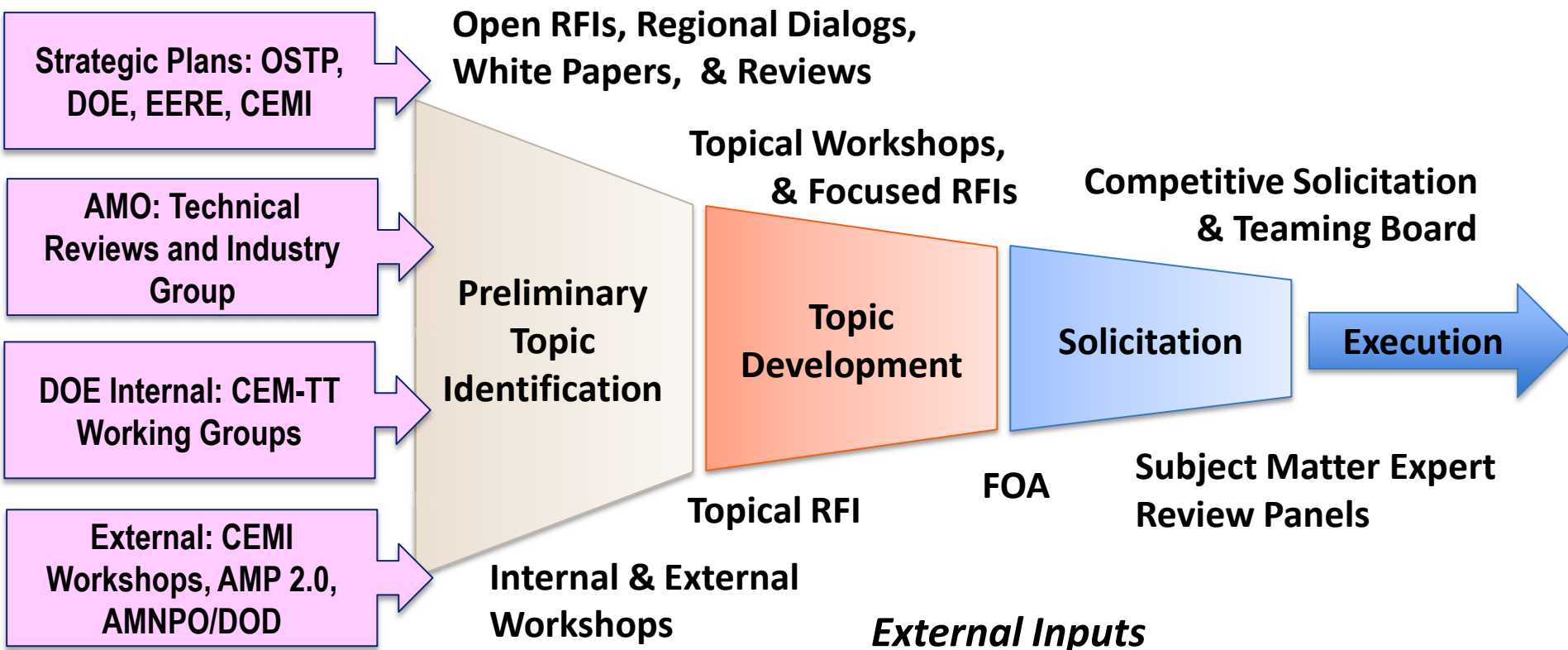
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*manufacturing.energy.gov***

Manufacturing Innovation Institutes

- ▶ Leverage effectiveness of regional, public-private partnerships to spur innovation and competitiveness of U.S. manufacturing
- ▶ Institutes form the core of the National Network for Manufacturing Innovation (NNMI); key tenets:
 - Develop critical technologies in TRL/MRL 4-7 range that will be used
 - Become self sustaining
 - Develop and educate an advanced manufacturing workforce
 - Bring together industry, universities and community colleges, federal agencies, and state & local governments
- ▶ Administration's Vision: up to 45 Institutes in 10 years



DOE Topic Development for Potential Institutes

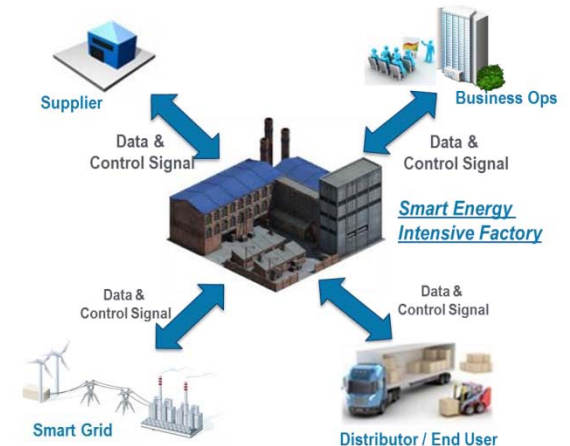
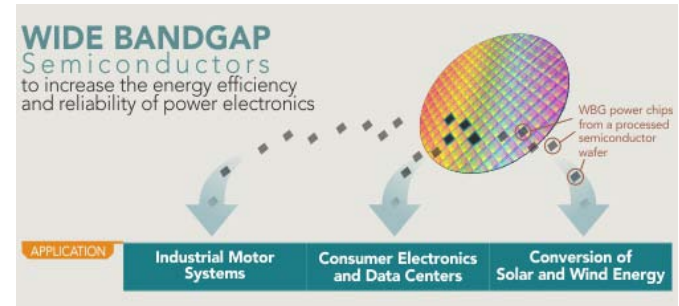


NNMI Topic Identification Criteria for DOE

EERE Core Questions	Application to NNMI Topic Selection
High Impact: <i>Why is this a high-impact problem? How would this technology development transform the marketplace?</i>	<ul style="list-style-type: none">• What is manufacturing challenge to be solved?• If solved, how does this impact clean energy goals?• If solved, who will care and why specifically?
Additionality: <i>How will EERE Funding make a large difference relative to what the private sector (or other funding entities) is already doing?</i>	<ul style="list-style-type: none">• Who is supporting the fundamental low-TRL research & why wouldn't they support mid-TRL development?• Who else might fund this mid-TRL development & how might EERE/AMO support catalyze this co-investment?
Openness: <i>How will EERE make sure to focus on broad problems and be open to new ideas, new approaches, and new performers?</i>	<ul style="list-style-type: none">• Has this mid-TRL Manufacturing Challenge been Stated Broadly?• Is there Fertile low-TRL Scientific Base to Address the Challenge?• Has a Broad Set of Stakeholders been Engaged in Dialogue?
Enduring Economic Benefit: <i>How will EERE funding result in enduring economic benefit to the US, particularly the manufacturing sector?</i>	<ul style="list-style-type: none">• Would this Manufacturing Challenge Impact More than One Clean Energy Technology Application?• Is Industry Currently Trying to Identify Solutions?
Proper Role of Government: <i>How does EERE funding represent a proper and high-impact role of government versus something best left to the private sector?</i>	<ul style="list-style-type: none">• What is the National Interest? What is the Market Failure? (Why Would Industry Not Solve this By Itself?)• Is there a Pathway for Federal Funding to End & What are the Metrics for This Transition?• Is there Large Potential for Follow-On Funding, & What are the Stage Gates to Follow-On Support?
+ Appropriate Mechanism	<ul style="list-style-type: none">• Why is this specific mid-TRL Problem Best Addressed through a 5-Year, Multi-participant, Industry-oriented Institute (NNMI) now?

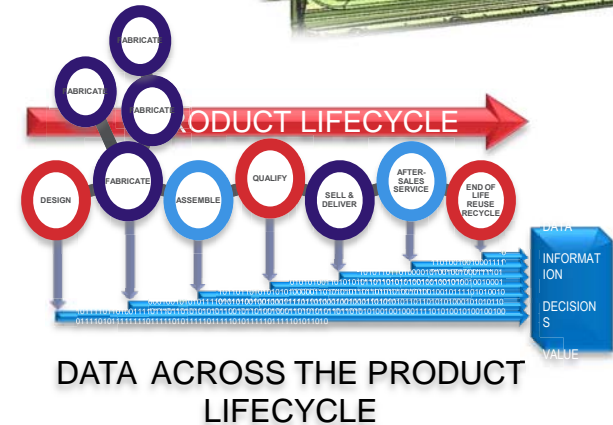
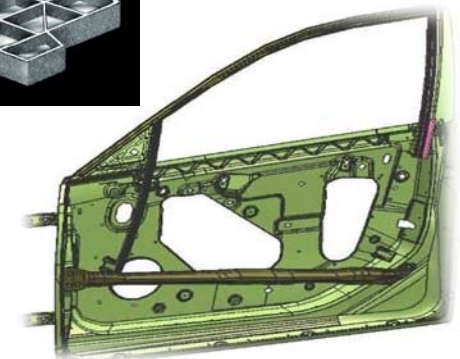
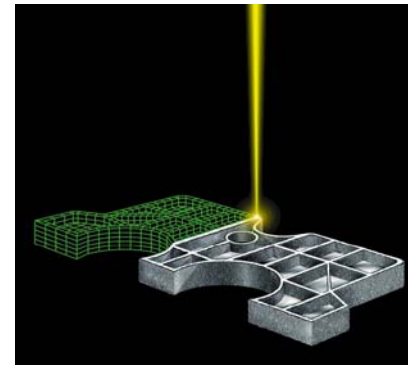
Clean Energy Manufacturing Innovation Institutes

- **PowerAmerica: Next Generation Power Electronics Manufacturing Innovation Institute, led by North Carolina State University**
- **Institute for Advanced Composites Manufacturing Innovation, in negotiation with team led by the University of Tennessee**
- **Smart Manufacturing: Sensors, Controls, Platforms, and Models for Manufacturing, funding opportunity announcement to be released 2015**



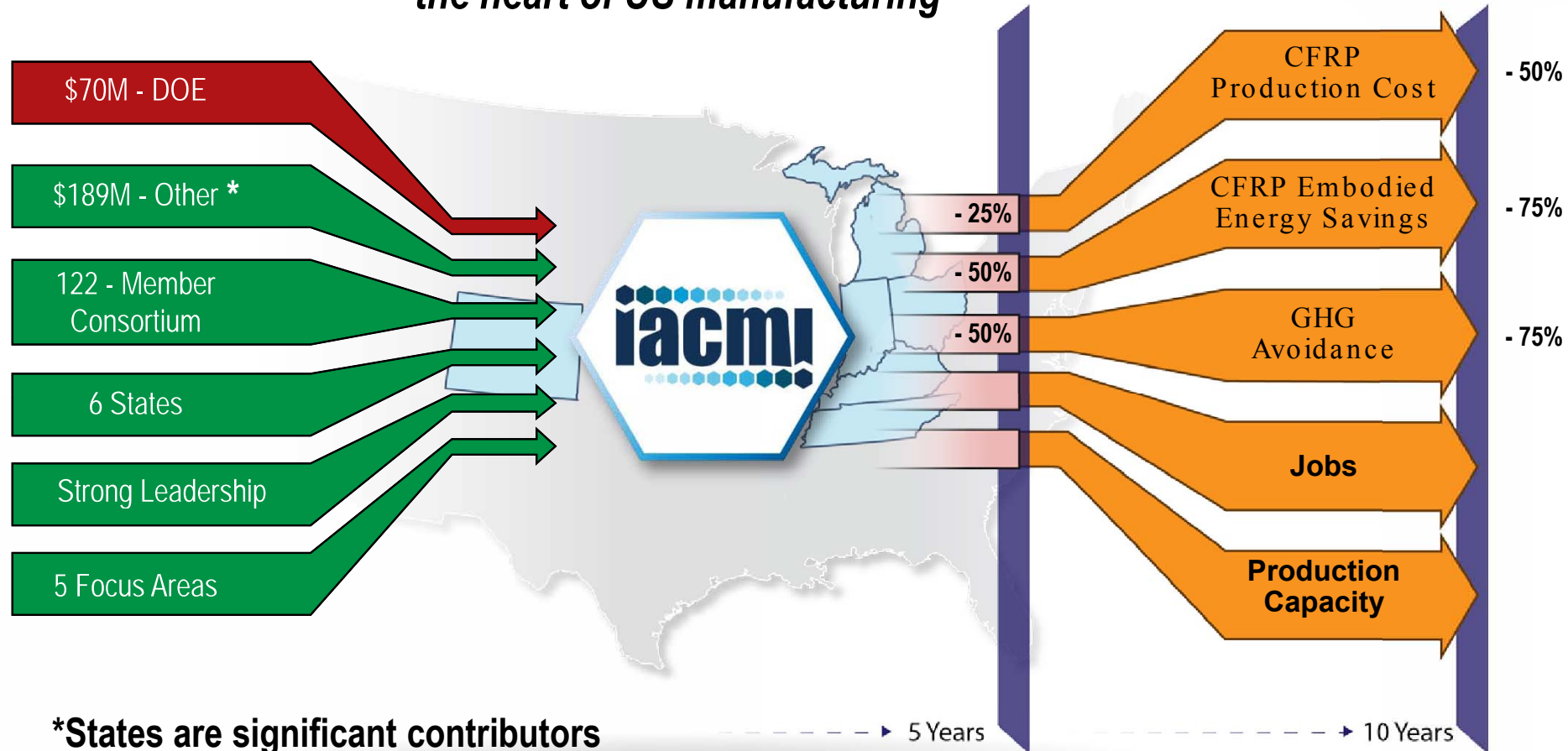
DOD Current and **Planned** Institutes

- America Makes
- Lightweight Innovations for Tomorrow (LIFT, formerly LM3I)
- Digital Manufacturing and Design Innovation
- **Integrated Photonics**
- **Flexible Hybrid Electronics**
- **Revolutionary Fibers and Textiles**



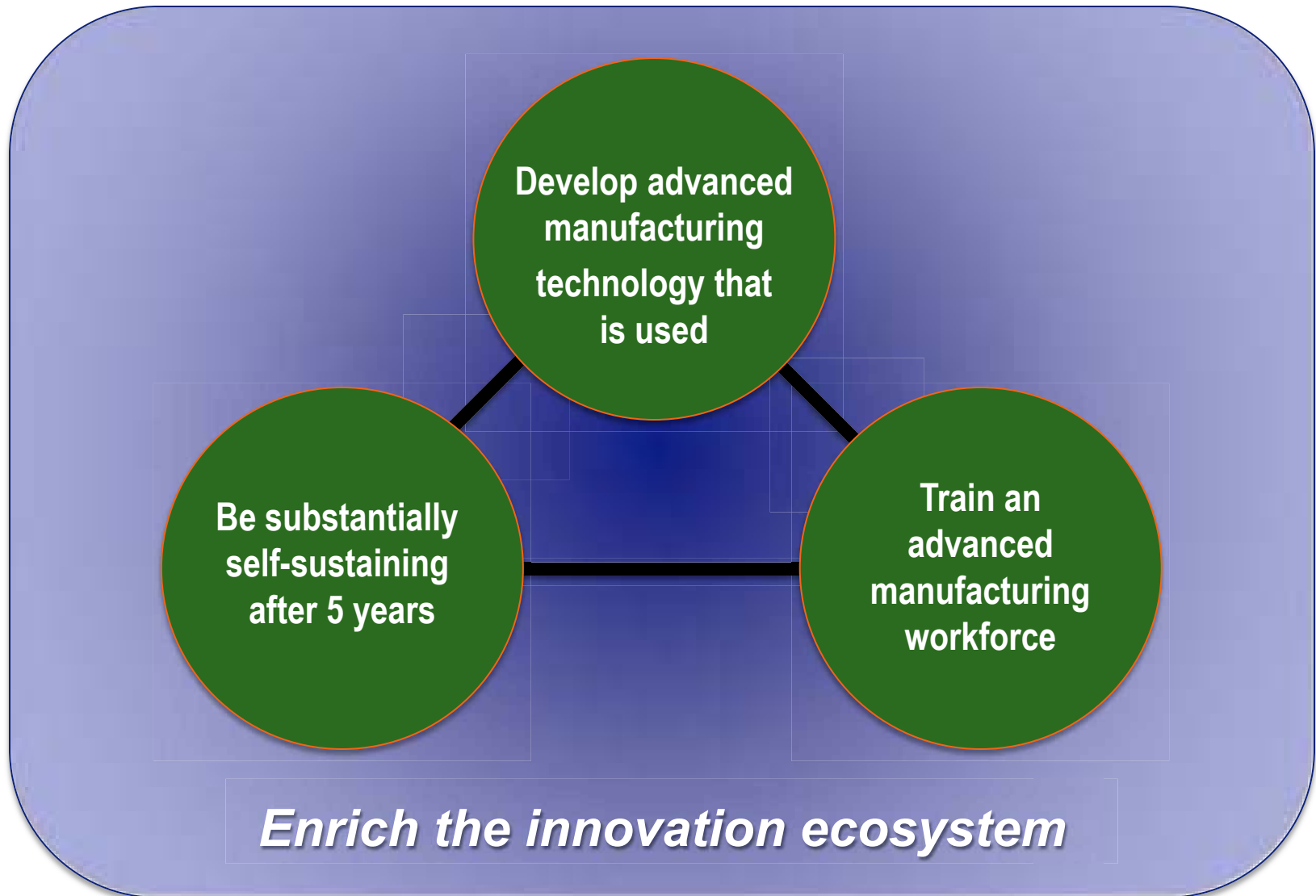
Institute for Advanced Composites Manufacturing Innovation (IACMI)

Federal investment will catalyze a composites ecosystem in the heart of US manufacturing



Institute announced on January 9, 2015

Clean Energy Manufacturing Innovation Institute Goals



Concluding Remarks

- **The Administration has awarded or announced nine Institutes for Manufacturing Innovation (DOE – 3, DOD – 6)**
- **DOE uses a rigorous process to select Institute topics that includes inputs from industry and universities; the DOD process is similar**
- **Institute goals are well defined**
 - **Develop advanced manufacturing technology that is used**
 - **Be substantially self-sustaining after 5 years**
 - **Train an advanced manufacturing workforce**
 - **Enrich the innovation ecosystem**